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07/625,637 12/07/90 FRALEY R 38-21 (10525)
EXAMINER FOX, D.
ART UNIT PAPER NUMBER
184 14

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DATE MAILED: 04/26/91

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COMPLETED 12/17/90 BY EXAMINER FOX, D.

This application has been examined Responsive to communication filed on preliminary 12/17/90 This action is made final.
A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. Notice of References Cited by Examiner, PTO-892.
2. Notice re Patent Drawing, PTO-948.
3. Notice of Art Cited by Applicant, PTO-1449.
4. Notice of Informal Patent Application, Form PTO-152
5. Information on How to Effect Drawing Changes, PTO-1474.
6.

Part II SUMMARY OF ACTION

1. Claims 1-18 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.
2. Claims _____ have been cancelled.
3. Claims _____ are allowed.
4. Claims 1-18 are rejected.
5. Claims _____ are objected to.
6. Claims _____ are subject to restriction or election requirement.
7. This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. Formal drawings are required in response to this Office action.
9. The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are acceptable; not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been approved by the examiner; disapproved by the examiner (see explanation).
11. The proposed drawing correction, filed _____, has been approved; disapproved (see explanation).
12. Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has been received not been received been filed in parent application, serial no. _____; filed on _____.
13. Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. Other

EXAMINER'S ACT

Claims 4, 5-6 (dependent thereon), 7, 8-9 (dependent thereon), 10, 11-12 (dependent thereon), 13, and 14-15 (dependent thereon) are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4, 7, 10, and 13 are indefinite in their recitation of "promoter selected from the group consisting of . . and a structural sequence" as it is unclear whether the structural sequence is intended to be a type of promoter. Insertion of a comma before the phrase "and a structural sequence", as in claim 16, would obviate this rejection.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 1-15 are rejected under 35 U.S.C. § 103 as being unpatentable over Anderson taken with Guilley et al. Anderson teaches a method for transforming plant cells with a chimeric gene comprising a viral promoter from the thymidine kinase gene and a bacterially-derived kanamycin resistance structural gene sequence heterologous to said promoter, wherein said transformation was carried out utilizing a plasmid comprising the T-DNA borders from an Agrobacterium tumefaciens plasmid, and wherein transformed kanamycin-resistant plant cells expressing the chimeric gene were recovered (see, e. g., column 5, lines 1-10, 22-25, 50-68; column 6, lines 1-28). Anderson does not teach heterologous gene expression driven by the CaMV 35S or 19S promoters. Guilley et al. teaches the identification of the 35S and 19S promoters of the plant-infecting CaMV, and also teaches the strength of these promoters, as evidenced by the high degree of expression of the associated structural genes in virally infected plants and when fragments of the CaMV genome are transcribed (see, e. g., page 763; page 769, column 2; page 770). It would have been obvious to one of ordinary skill in the art to utilize the viral promoter-mediated method for plant transformation taught by Anderson, and to modify that method by incorporating the CaMV 35S or 19S promoters taught by Guilley et al. for increased structural gene expression, given the

recognition by those of ordinary skill in the art of the benefits of strong promoters for increased expression of heterologous genes, and the recognition by those of ordinary skill in the art that the transformation method and promoters would have each continued to function in their known and expected manner. Thus, the claimed invention was clearly prima facie obvious as a whole to one of ordinary skill in the art at the time it was made, especially in the absence of evidence to the contrary.

Claims 16-18 are rejected under 35 U.S.C. § 103 as being unpatentable over Anderson taken with Guilley et al. as applied to claims 1-15 above, and further in view of Zambryski et al. Anderson taken with Guilley et al. teaches a method for plant transformation utilizing the CaMV 35S and 19S promoters as discussed supra, but does not teach the regeneration of whole plants from transformed cells. Anderson also teaches the utility of a disarmed vector with deleted tumor genes (see, e. g., column 4, lines 39-45). Zambryski et al. teaches the regeneration of whole plants from cells transformed with a disarmed vector containing chimeric genes, T-DNA borders and deleted tumor genes, wherein said disarmed vector solved the previously observed barrier to the obtention of whole transformed plants (see, e. g., page 2143, column 2, first full paragraph; page 2145, column 1, third full paragraph, paragraph bridging columns 1 and 2; page 2149, column 1). It would have been obvious to one of ordinary skill in the art to utilize the method of CaMV promoter-mediated

plant transformation with a disarmed vector taught by Anderson taken with Guille et al., and to modify that method by incorporating the plant regeneration from transformed cells taught by Zambryski et al., given the recognition by those of ordinary skill in the art of the benefits of obtaining whole transformed plants, and the recognition that the plant transformation techniques and plant regeneration techniques would have each continued to function in their known and expected manner. Thus, the claimed invention was clearly prima facie obvious as a whole to one of ordinary skill in the art at the time it was made, especially in the absence of evidence to the contrary.

Applicants' arguments filed 7 December 1990, insofar as they pertain to the rejections above, have been fully considered but they are not deemed to be persuasive. Applicants urge that rejection of the claims under 35 U.S.C. 103 is improper, given the results of the Horsch declaration filed 7 December 1990 which allegedly demonstrate the inoperability of the viral promoter utilized by Anderson. The Examiner maintains that the Horsch declaration does demonstrate the function of the thymidine kinase promoter in the expression of the associated kanamycin resistance gene in transformed plant cells, as evidenced by the increased callus growth and shoot production of plant cells transformed with the thymidine kinase promoter-driven KAN gene (labeled "pMON16301" in Figure 3 of the declaration) relative to the

control cells lacking the chimeric KAN gene (labeled "pMON813"). Furthermore, the allegations in the Horsch declaration regarding the lack of heterologous gene expression are unsupported and not persuasive, since no tests for the presence of the KAN transcript or the KAN gene product were performed. In addition, it is noted that the vector utilized by Horsch contained a polyoma virus sequence not present in the vector utilized by Anderson, so that the applicability of the results of the Horsch declaration is unclear. It is noted that it is not within the purview of the Examiner to evaluate the validity of issued U.S. patents.

Applicants urge that rejection of the claims under 35 U.S.C. 103 is improper, given the unexpected results of higher gene expression when utilizing the CaMV promoters, as evidenced by the Horsch declaration filed 7 December 1990. The Examiner maintains that high levels of gene expression are not unexpected, given the teachings by Guilley et al. of the high level of expression of the plant virus-derived CaMV 35S and 19S genes in infected plants and in in vitro systems, as discussed supra.

Applicants urge that rejection of the claims under 35 U.S.C. 103 is improper, given the lack of other non-plant promoters' function in plant cells, the alleged failure of Anderson to conclusively demonstrate the function of the thymidine kinase promoter in transformed plant cells, the possible requirement for trans-acting factors for CaMV promoter function as illustrated by the discussion in the Rogers declaration filed 18 December 1989

regarding the requirements for such factors in other viruses, and the non-analogous in vitro transcription system utilized by Guille et al., as asserted in Applicants' response filed 8 June 1990 in the parent application.

With respect to the failure of other non-plant promoters to work in plant cells, the Examiner maintains that the thymidine kinase promoter utilized by Anderson did work, as discussed in the Anderson patent and as demonstrated by the Horsch declaration filed 7 December 1990.

With respect to the alleged failure of Anderson to conclusively demonstrate the function of the thymidine kinase promoter in transformed plant cells, the Examiner maintains that the cell division in kanamycin-containing medium provided sufficient evidence, which was corroborated by the Horsch declaration filed 7 December 1990, as discussed supra. It is noted that it is not within the purview of the Examiner to evaluate the validity of issued U.S. patents, as discussed supra.

With respect to the existence of trans-acting factors whose absence in excised CaMV promoters would not lead one of ordinary skill in the art to expect successful promoter function, the Examiner maintains that the evidence presented in the Rogers declaration regarding viral trans-acting factors dealt with viruses whose relationship to CaMV is unclear. Furthermore, Guille et al. demonstrated CaMV promoter function in the absence of the entire CaMV genome. Applicants' allegations that the

portion of the CaMV genome utilized by Guilley et al. would have been large enough to contain sequences encoding trans-acting factors are not deemed persuasive, in the absence of any evidence regarding the actual existence or location of such sequences in CaMV.

With respect to the alleged non-analogous nature of the transcription system utilized by Guilley et al., the Examiner maintains that the demonstration by Guilley et al. that the CaMV 35S and 19S promoters are strongly expressed in infected plant cells, coupled with the demonstration by Guilley et al. that the 35S and 19S genes contained in fragments of the CaMV genome are expressed in an in vitro transcription system, provides a reasonable expectation of successful 35S and 19S promoter function in plant cells. It is noted that only a reasonable expectation of success is required for determinations of obviousness, as taught in In re O'Farrell, 7 USPQ 2d 1673, 1681 (Fed. Cir. 1988).

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (703) 308-1120.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

David T. Fox
April 4, 1991

DJF

Elizabeth C. Weimar
ELIZABETH C. WEIMAR
SUPERVISORY PATENT EXAMINER
ART UNIT 184